A PIEBALD FAMILY OF WHITE AMERICANS

By ALBERT ERNEST JENKS

IN an American university is a member of an old-line American family now living in the Northwest and scattered over at least four states, which for three succeeding generations exhibits an unusual marking of the skin. I have examined and photographed piebald members of each of these three generations. My informant tells me of a piebald cousin of his father whom he well remembers, thus affording knowledge of piebaldism in four succeeding generations.

I shall not take time to describe the exact markings of the skin of the three persons shown in the accompanying illustrations; however, there are some important facts that should be noted. The light areas, or spots, are strikingly bilateral, with considerable symmetry; they occur with marked consistency at the more important joints of the body—as ankles, knees, hips, wrists, elbows, and shoulders. There is also a tendency to a median dorsal light line. This light dorsal area is the opposite of what Castle reports in his family of spotted negroes.[1] He found a dark dorsal area.

Family History

The American history of this family, so far as is now known to me, is as follows: The family is of Welsh and Scotch origin. Though no part of the family has had its American ancestry traced completely, the first man known in America bearing the common patronymic was living in New England in 1668. Members of this family believe that this New Englander is their original American ancestor.

My chief informant (number 7 in the genealogy chart, fig. 74) tells me that his father (number 1) was born in Ohio in 1813 and moved to southwestern Michigan when a youth. There he married

[1] Q. I. Simpson and W. E. Castle, A Family of Spotted Negroes, *American Naturalist*, Jan., 1913, pp. 50–56, ills.

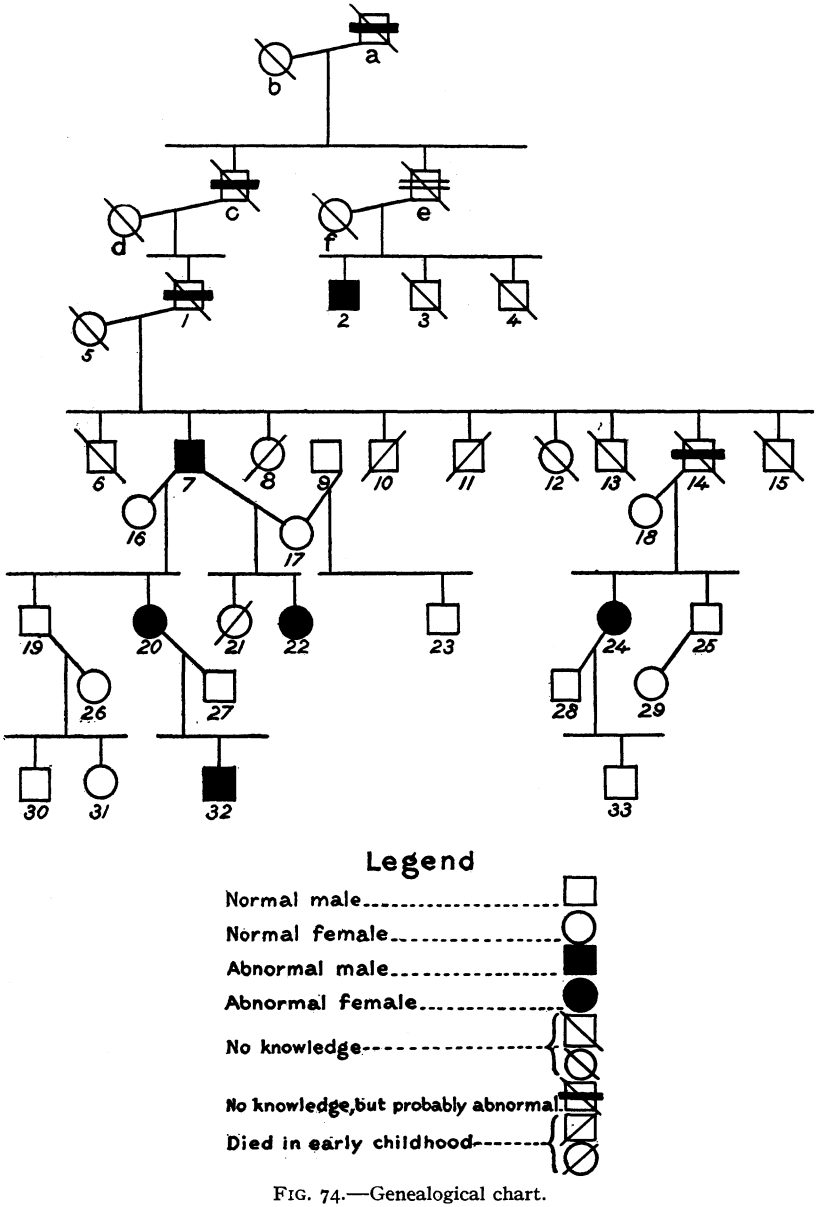


FIG. 74.—Genealogical chart.

a young woman whose family had also migrated from Ohio. Number 1 lived all his life on his farm in Michigan, became the father of two daughters and seven sons, and there at the age of fifty-one years died of lung fever—"what would now be called pneumonia."

The genealogy chart (fig. 74) shows that my chief informant is a piebald male. He well recalls his personal boyhood knowledge of a cousin of his father who was also spotted, and who lived near his father's home in Michigan. This person is number 2 in the genealogy chart. No descendant of number 1 has knowledge of any piebald members of the family other than those shown in the chart. No opportunity has been opened for study of the still existing Michigan branch of the family, though I have personal knowledge of some of its members whom I knew by name during my college days. I can vouch for said persons as above the average in education and moral fiber; one I recall well, even in facial features, who was a college trustee.

INDIVIDUAL HISTORY

A short individual history of the descendants of number 1 follows. First appears a list of persons in the first filial generation, though it is the second successive generation known to bear piebalds.

Number 6 was a male of unknown pigmentation, born in 1838, unmarried, who died of rheumatism at 55 years of age.

Number 7 is a pigmented male, born in 1840. He has married twice, and is the father of two children by each wife. Today he lives in Minnesota; he is my chief informant concerning the history of this family. He is shown in figure 75, and more facts about him will be presented later.

Number 8 was a female of unknown pigmentation, born in 1842, who died of unknown cause at 3 or 4 years of age.

Number 10 was a male of unknown pigmentation, born in 1845, who died of unknown cause at 3 or 4 years of age.

Number 11 was a male of unknown pigmentation, born in 1846 or 1847, who died of unknown cause at 4 or 5 years of age.

Number 12 was a female of unknown pigmentation, born in 1848, married but without children. She died of dropsy at about 25 years of age.

Number 13 was a male of unknown pigmentation, born in 1849, who died at 22 or 23 years of age in an asylum, after having suffered some time with epilepsy.

Number 14 is a male of unknown but probably abnormal pigmentation, born in 1850, and still living in Missouri. He has been afflicted with dropsy, but has completely recovered; now has excellent health and works all the time.

Number 15 was a male of unknown pigmentation, born in 1853; was not very strong and in consequence was given the lighter tasks about the farm, but he was never sick. At the age of about 30 he went to California and was for 8 or 10 years a successful collector there. He disappeared completely in 1892; all efforts of the family to trace him have been futile.

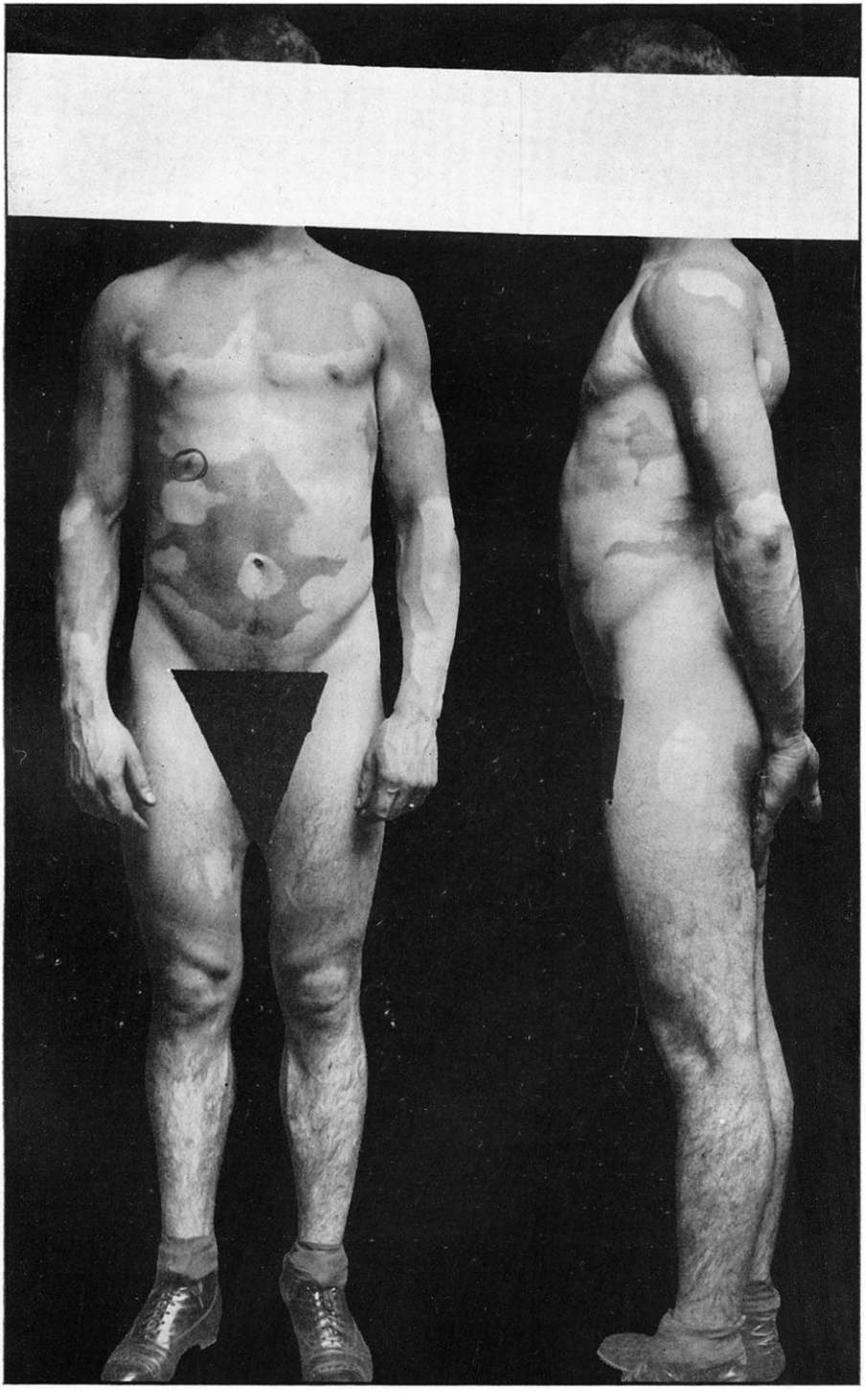
Two of the above described persons, numbers 7 and 14, have descendants. One of the two, number 7 and my chief historical informant, is shown in figure 75. By his first wife (normally pigmented, number 16) there are two children, numbers 19 and 20; number 20 is abnormally pigmented. By his second wife (normally pigmented, number 17) there were also two children, numbers 21 and 22; number 22 is abnormally pigmented.

The wife of number 14 (normally pigmented, number 18) has borne him two children, numbers 24 and 25; number 24 is abnormally pigmented.

The following descriptive list contains the second filial generation of number 1, and the third successive generation known to bear piebalds.

Number 19 is a normally pigmented male, born in 1862. He has a blond complexion, with brown hair and gray eyes. His health is excellent and he is a successful professional man. He is married, and his wife (normally pigmented, number 26) has borne him two children, numbers 30 and 31.

Number 20 is an abnormally pigmented female, born in 1871. She has a blond complexion, with brown hair and gray eyes. She has excellent health and is successfully engaged in public professional activity. She is widowed, and by her husband (normally pig-



ABNORMALLY PIGMENTED MALE (No. 32 OF THE CHART)

mented, number 27) is the mother of number 32, shown in accompanying plates XX and XXI.[1]

Number 22 is an abnormally pigmented female, born in 1894. She has a blond complexion, with brown hair and gray eyes. She has excellent health, is unmarried, and is a successful college student. The chief pigment spots of this subject are shown on the drawing in plate XXII. More facts will be presented later concerning her.

Number 24 is an abnormally pigmented female, born in 1882. She has a blond complexion, with brown hair and gray eyes. She has excellent health, is married, and by her husband (normally pigmented, number 28) has a son, number 33, born in 1908.

Number 25 is a normally pigmented male, born in 1884. He was married in 1912, has excellent health, and is a successful young man.

The following persons are members of the third filial generation of number 1, and the fourth successive generation known to bear piebalds.

Number 30 is a normally pigmented male, born in 1890. He has a rufous complexion, with light-brown hair and gray eyes. He is unmarried, has always had delicate health, and seems to be generally undervitalized.

Number 31 is a normally pigmented female, born in 1894. She has a blond complexion, with light-brown hair and gray eyes. She is unmarried, has excellent health, and is successful..

Number 32 is an abnormally pigmented male, born in 1892. He is a blond, with straw-colored hair and blue eyes. He is a successful university student in excellent health. He is shown in plates XX and XXI, and more facts concerning him will be presented later.

Number 33 is a normally pigmented male, born in 1908. He has a blond complexion, with light hair and blue eyes. His health has always been excellent.

Description of Piebald Individuals

Number 2 in the chart is the first such person of whom I have knowledge; and the only knowledge of him I now possess is that

[1] I am indebted to Dr Frary, of the School of Chemistry, University of Minnesota, for his photographic work in connection with the plates of persons shown herewith.

about 60 years ago he lived on a farm in southwestern Michigan and was "as spotted as a leopard"—as described by number 7. Concerning his two brothers (numbers 3 and 4) I have no knowledge other than that they once existed.

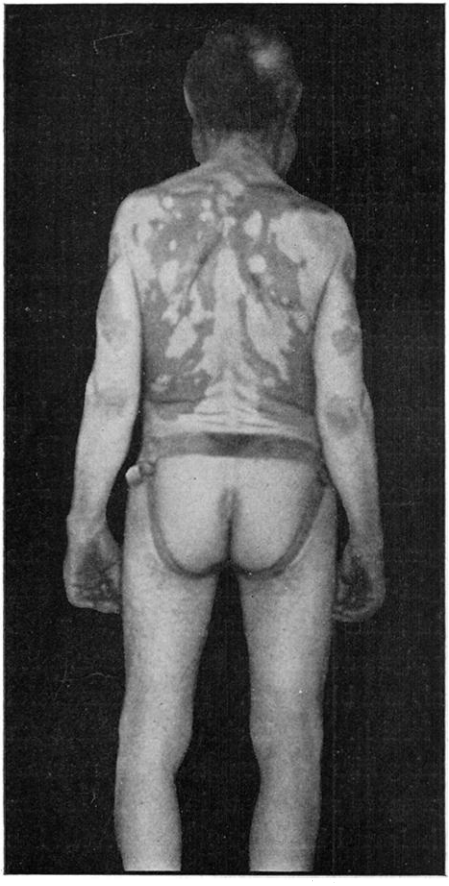
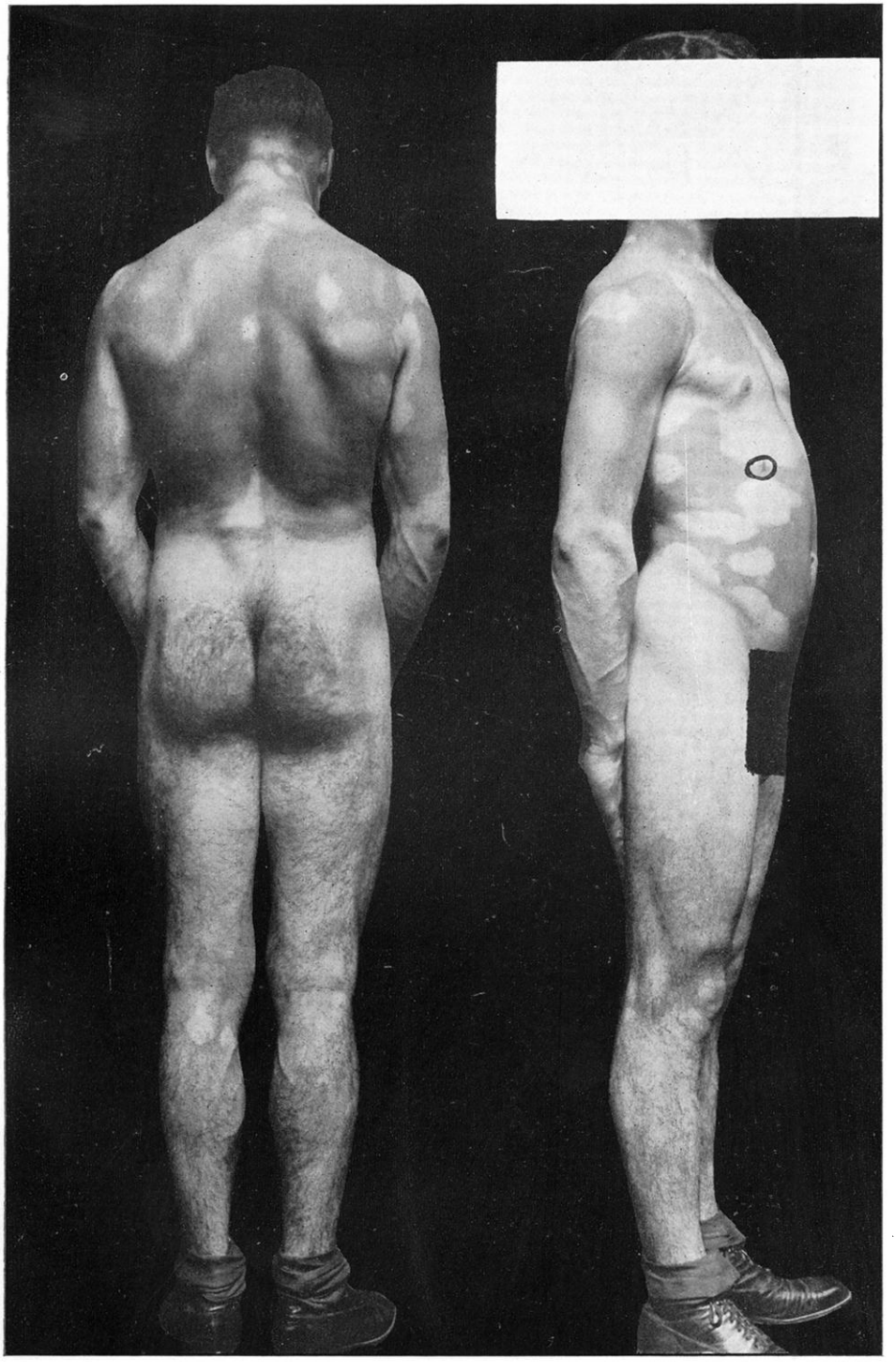


FIG. 75.—Rear view of pigmented male (No. 7 of the chart).

Our knowledge of number 7, shown as figure 75, is quite complete. And the facts disclosed by his descendants are as satisfactory as though one had been equipped to carry on breeding experiments with domestic animals. By his normally pigmented first wife, number 16, this man has two children. One of these, the son, number 19, is normally pigmented, and has two grown children, both of whom are normally pigmented. The other offspring of numbers 7 and 16 is number 20, an abnormally pigmented daughter. She is the mother of an abnormally pigmented son, number 32 (pl. XX and XXI) by a normally pigmented husband, number 27. By his normally pigmented second wife (number 17) this man (number 7) also has two children; one, number 21, died in infancy, the other is the abnormally pigmented young woman shown in plate XXII.

Additional interest is developed in the problem of the inheritance



ABNORMALLY PIGMENTED MALE (No 32 OF THE CHART)

of the character of abnormal pigmentation when it is known that female number 17, the normally pigmented second wife of number 7, has living today a twenty-two year old normally pigmented son (number 23) by a normally pigmented first husband (number 9).

The man, number 7, is a hard-working farmer in Minnesota whose health has been excellent during his 74 years, until recently when he was severely injured by a falling tree. His toil has been successful, so he has given a college education to the two children by his first wife, and his living daughter by his second wife is now a college student. He has the reputation in his home neighborhood of being a hard-working, "smart," very generous man, who knows more about general farming than most of his neighbors. He is keen and alert about personal and public matters, and the saving sense of humor runs through his philosophy of daily life. When I first consulted him in May, 1913, he regretted that unusual weather conditions had kept him for three days from reading the daily papers. This was a disappointment to him, as he was alive to the intricacies of the Balkan war and the daily developments in the national problem of tariff revision.

The abnormally pigmented young woman, number 22 (pl. XXII), is a college student in excellent health, whose physical development is above the average for her age. To substantiate

Gymnasium Records[1]

NUMBER 22		AVERAGE OF 392 GIRLS
Age (years)	$18\frac{10}{12}$	19
Height standing	115.7 cm.	110.2 cm.
Height sitting	61.5 cm.	61.3 cm.
NUMBER 22		**AVERAGE OF 51 GIRLS**
Age (years)	$18\frac{10}{12}$	19
Height standing	115.7 cm.	115.7 cm.
Chest expansion	3.8	2.5
Grip, arm, right	30.00	27.3
Grip, arm, left	26.00	24.7
Chest, depth	9.5	9.78
Lungs, capacity	181.00	150.6

[1] This young woman (number 22) was measured, and the other measurement records were furnished me by Dr Anna Norris, Director of Physical Education for Women, University of Minnesota. The illustration (pl. XXII) is introduced to show only the principal pigmented areas.

appearances I present her gymnasium record at the age of 18 years and 10 months, as compared with 392 Connecticut and Nebraska college girls at 19 years of age, so far as the first two measurements are concerned. For the other measurements number 22 is compared with 51 of the above girls who were of the same height, as well as the same age, as herself:

These records show that number 22 is physically very safely above the average, and the number whose average is taken is sufficiently large to make the results of scientific value.

Her scholarship record practically duplicates the average of her 106 classmates, and it improves with experience in college.

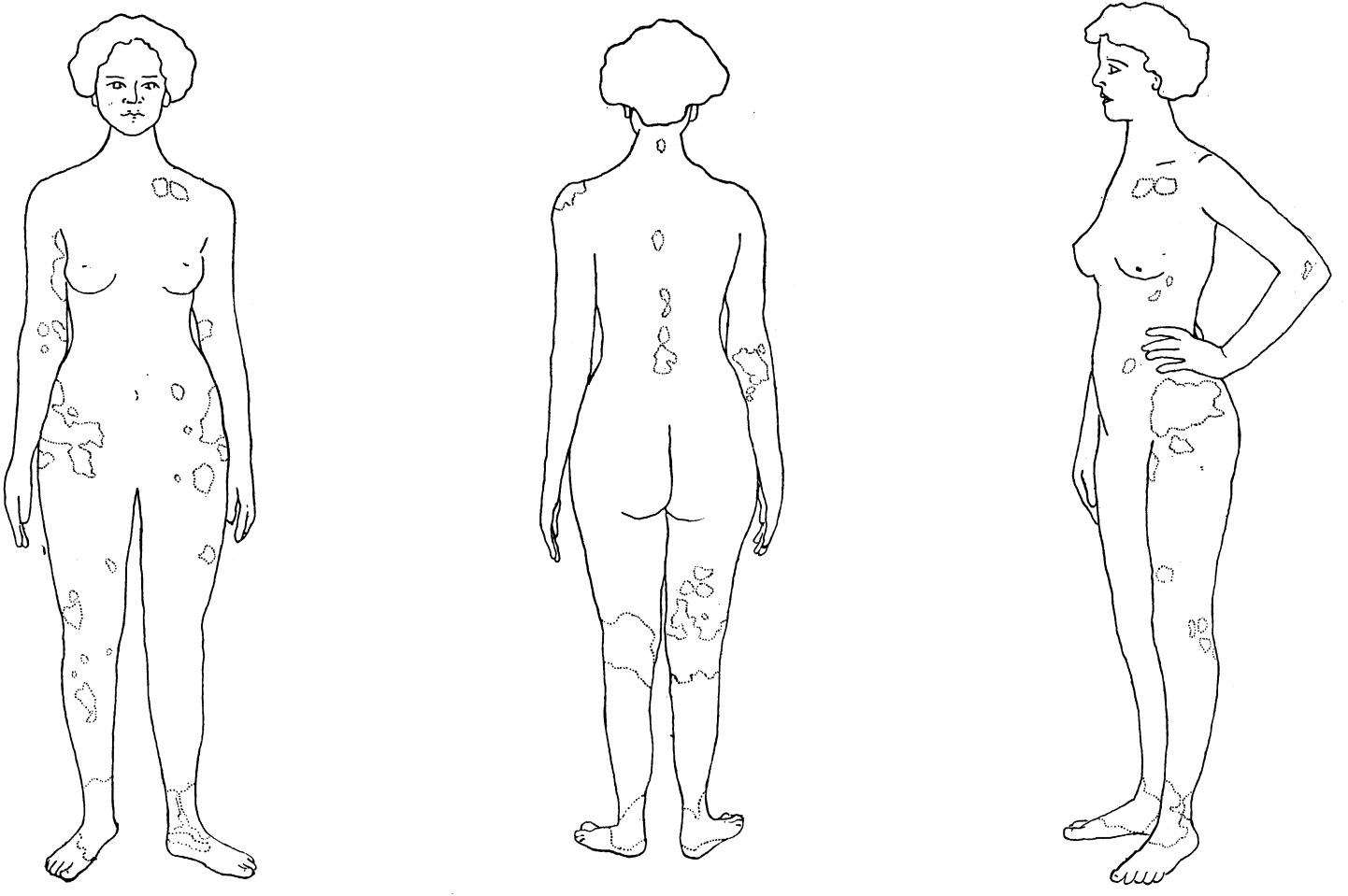
The young man (pls. XX and XXI) has a blaze face such as is seen in Castle's negroes and also in most of the piebalds shown in *A Monograph on Albinism in Man.*[1]

The blaze extends up to the crown of the head, where there is a small patch of white hair. White hairs occur also on the following parts of his body: both thighs in front, and slightly on the back of the left thigh; both shins in front; right side of pubic hair area, and entirely across immediately above the penis. There are no white hairs on pigmented skin areas, but there are many white skin areas producing only normally colored hairs.

The young man, number 32, has even a more favorable record in both the gymnasium and the class-room than the young woman:

Number 32 was far above the average when first measured—seen especially in his "total strength" of 772 points when a freshman as against 570.7 for the average of 1200 freshmen. This total strength has increased during the sixteen and one-half months which elapsed between the first and second measurements—advancing from 772 to 801. His heart action has also greatly improved. In his university a student's scholastic record is kept in terms of "excellent," "good," "pass," and "not pass." Since one's graduation

[1] Atlas, pt. 2, published by Karl Pearson, E. Nettleship, C. H. Usher, and B. C. Lamb, London, 1913. The first illustration published of Castle's piebald Negroes, so far as I have seen, is that of Sir Jonathan Hutchinson in an article entitled "On Palæogenetic Face-pattern in Acroteric Piebalds," pp. 1479–1481 of *The British Medical Journal*, vol. 1, June 18, 1910. This plate was again reproduced as plate W (picture 138), entitled "The Three Striped Graces," in *A Monograph on Albinism in Man*, atlas, pt. 1, London, 1911.



THE PRINCIPAL PIGMENT SPOTS ON A FEMALE (No. 22 OF THE CHART)

depends on his percentage of "goods," an *excellent* and a *pass* cancel each other and make two *goods*. The following records are given, therefore, with the *excellent* marks omitted.

Gymnasium Records of Number 32 and 1200 Other Freshmen[1]

	No. 32 Nov. 18, 1911	No. 32 Apr. 2, 1913	Aver. Meas. of 1200 Freshmen
Girth, chest, depressed	34+	34.2	33.1
" " inflated	37+	36.8	36.2
" " normal	35.5+	35.8	34.7
Capacity, lungs	251−	249	257
Times, push up	12+	12	7
" pull up	7−	10	8
" sum	19	22	—
" weight	kilos[2] 62.5+	63.9	61.9
Strength of arms	" 119	140	—
" chest	" 20+	17	12.8
" back	" 165+	193	161
" legs	" 375+	352	210
" right forearm	" 49=	50	49
" left forearm	" 44−	49	45
" total	" 772+	801+	570.7
Pulse, before push up	90+	68	77
" after " "	130+	117	110

Scholastic Records of Number 32 and Other Students

One hundred freshmen and sophomores (both men and women) selected at random averaged:

Good	*Pass*	*Not Pass*
16/27	8/27	3/27

Whereas, for the same two years number 32 averaged:

Good	*Pass*	*Not Pass*
25/27	2/27	0/27

[1] All measurements in this table were made for me by Dr L. J. Cooke, Director of Physical Education for Men, University of Minnesota, and his assistant, Mr William Foster.

[2] One kilo equals 2.2046 lbs. Weight and strength are expressed in kilos except push up and pull up, which are expressed in number of times. Measurements are expressed in inches and tenths of inches. Lung capacity is expressed in cubic inches. Pulse rate is expressed in number of beats per minute before and after strength tests.

The average marks of women are higher than those of men, so his record is clearly much above the average for men—as it is even above the average for both men and women.

The men in his fraternity averaged the first semester of 1912–13 as follows:

Excellent	*Good*	*Pass*	*Not Pass*
$1\frac{5}{16}$	$1\frac{15}{16}$	$1\frac{13}{16}$	$\frac{9}{16}$

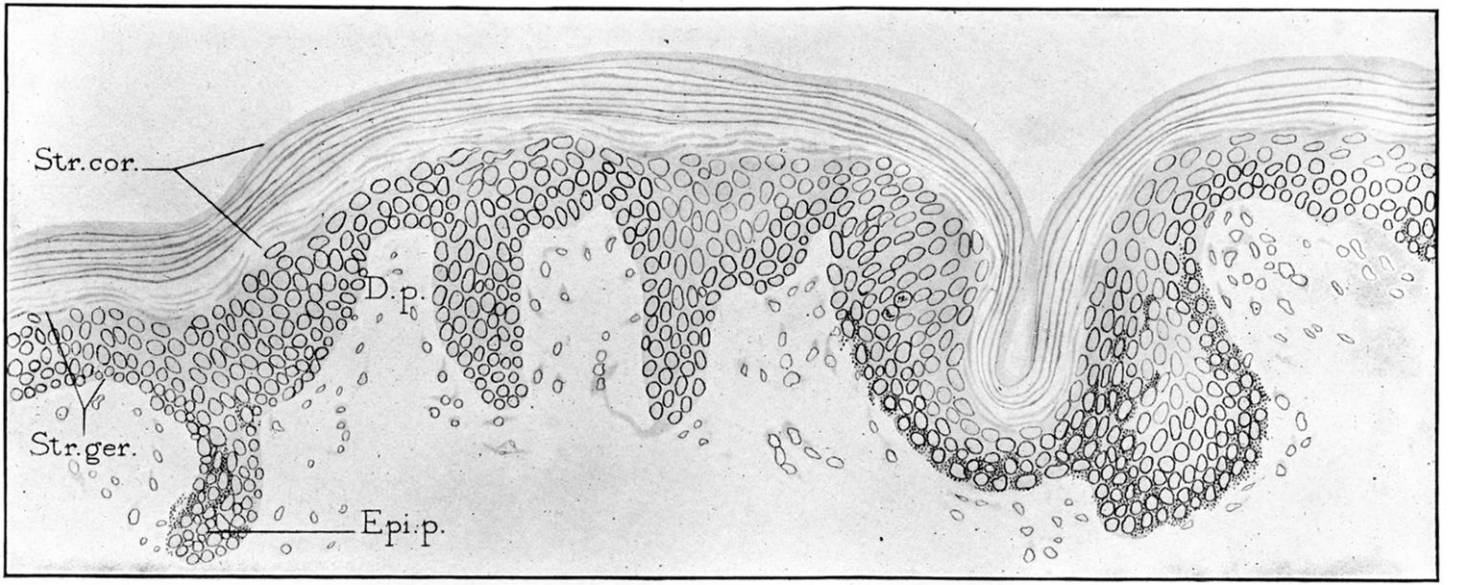
Whereas number 32 averaged for his first two years—

Excellent	*Good*	*Pass*	*Not Pass*
$1\frac{8}{16}$	$3\frac{4}{16}$	2	0

This record is considerably above the average of his fraternity fellows.

So, in spite of the rather unfavorable vital history of this family, the intimate facts presented about the three abnormally pigmented persons shown in the accompanying illustrations, and the facts known about the two other abnormally pigmented persons shown in the chart, present conclusive evidence that so far as those individuals are concerned the abnormal pigmentation does not appear to have weakened them physically, mentally, or morally (i. e., volitionally toward present-day ideals and conventional conduct).

When the genealogy chart is examined there seems no question about this statement that the character of abnormal pigmentation exhibited by persons numbers 32, 22, and 20 is hereditary; further, the character behaves like a simple Mendelian dominant; still further, it appears that these persons are heterozygous for this character of abnormal pigmentation. If this is true, then it is expected that number 1 (the father of number 7), and also males *c* and *e*, who are brothers, and who are fathers, respectively, of numbers 1 and 3, were also abnormally pigmented. So, also, the female *b* or the male *a* was probably abnormally pigmented; in the chart I have suggested that it was probably the male *a*. My reason for this will be made clear near the close of this paper.



DRAWING, UNDER LOW POWER, OF THE PORTION OF THE SECTION WHICH PASSES THROUGH THE BOUNDARY LINE BETWEEN THE LIGHT AND DARK AREAS OF SKIN FROM THE RIGHT SIDE OF No. 32 (PLATES XX AND XXI)

This character of abnormal pigmentation is not sex-limited, as is plainly seen by the fact that numbers 2, 7, and 32 are males, while numbers 20, 22, and 24 are females; also by the fact that male 32 inherits directly from his mother, number 20, while females 20 and 22 inherit directly from their father, number 7; while, again, male 7 must have inherited through the male for three antecedent generations to arrive at a common ancestor for the first two known abnormally pigmented persons, numbers 7 and 2.

Though this character of abnormal pigmentation is hereditary, the visible patent condition of skin spotting is not known to be congenital. These three persons illustrated here show what is scientifically known as "partial or imperfect albinism." I shall call it "progressive albinism."

That white hairs and light skin areas of person number 32, the member of the youngest generation known to be pigmented, are strictly albinistic is proved by microscopic examination. White hairs from the head of this man were examined and proved to be without pigmentation. Plates XXIII and XXIV present three drawings of the skin taken from the right side of the body of this man. The place from which the skin was taken is marked by the circle shown in plates XX and XXI.[1]

A piece of skin, including both light and dark areas, was fixed in a mixture of formalin, corrosive sublimate, and acetic acid immediately after excision. This was later imbedded in paraffin and cut into very thin sections. Some of these sections were stained and others were mounted without staining. The preservation of the epidermis proved to be perfect, and the pigment granules were well preserved in both the epidermis and corium. Both light and dark areas are included in the same section, thus greatly facilitating comparison of the two areas.[2]

Plate XXIII is a drawing, under low power, of the portion of the section which passes through the boundary line between the light

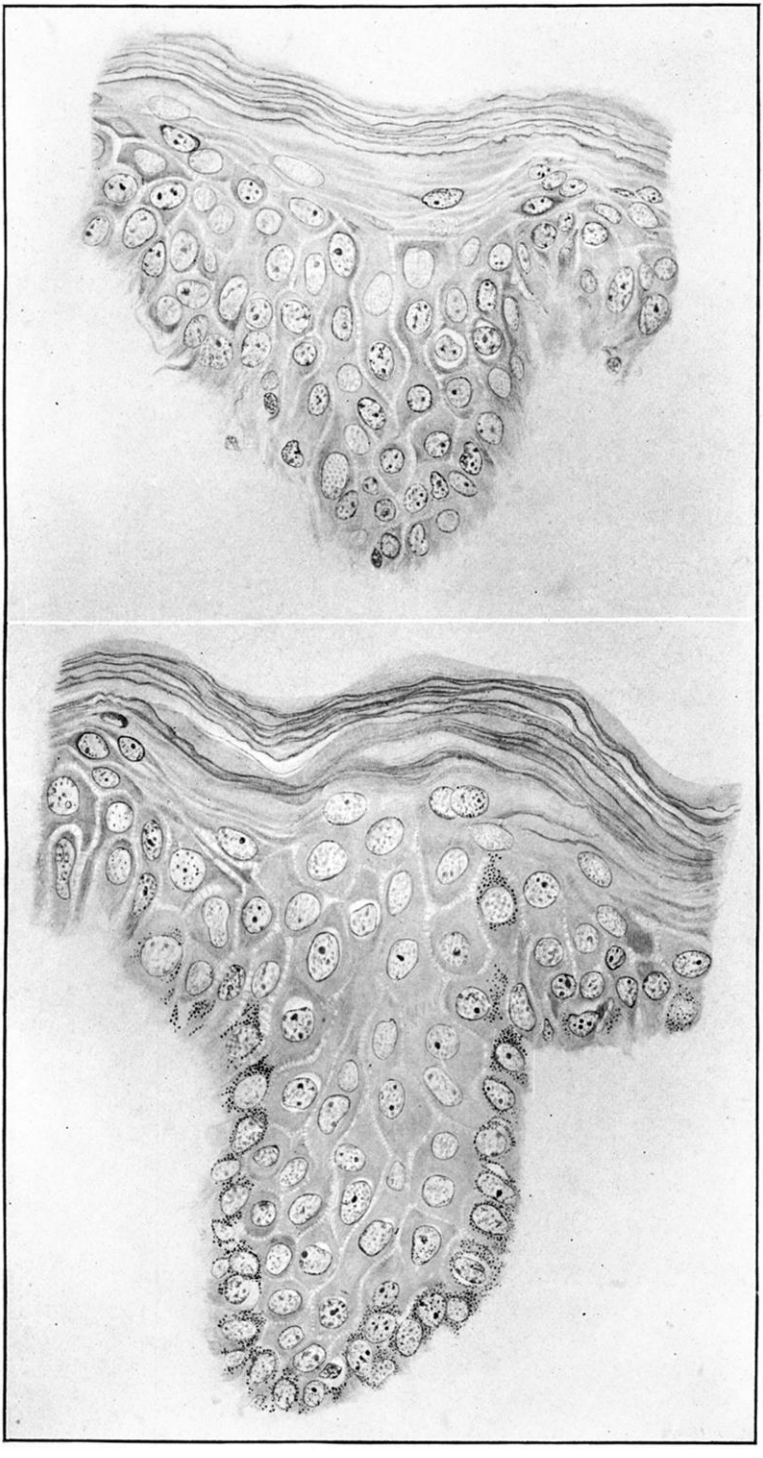
[1] The operation for the removal of this section of skin was performed by Dr Earl M. Hare, of the College of Medicine, University of Minnesota.

[2] Dr Hal Downey, of the Biological Department of the University of Minnesota, gave me unstinted time in the preparation and microscopic examination of the skin and hair of this man.

and dark areas. It shows the general structure of the skin and the distribution of the pigment granules in the section. *Str. cor.* is the stratum corneum; *Str. ger.* is the stratum germinativum; *Epi. p.* is an epidermal papilla; and *D. p.* is one of the papillæ of the connective tissue portion of the skin, the so-called dermis or corium. Plate XXIV reproduces two accurate drawings, under high power, of epidermal papillæ of the light non-pigmented area, and of the dark area, respectively.

In the living skin there is visible a sharp boundary line between the light and pigmented areas, as is well shown in plates XX and XXI, but in the microscopic sections such a sharp line is not so evident. In the section from which plate XXIII was made the first pigment granules appear in the epidermal process (*Epi. p.*) on the left of the figure. The figure shows that the pigmentation involves several cells of this papilla. In other sections examined the first pigment is not so abundant, and does not involve so many cells as in the one shown as plate XXIII. This is especially true of those sections in which the first pigment granules appear in the basal cells of the epidermis which lines one of the furrows of the skin. In those cases only a few cells contain the granules, and those first granules are small and not numerous in any one cell.

The epithelium of the light areas, as is shown in plate XXIII, is absolutely devoid of pigmentation, but the corium contains an occasional irregular or branched pigment cell. As we approach the dark area the scattered pigment cells of the corium are seen to become more numerous, especially along the ducts of the sweat glands, but as yet no pigment is to be seen in the epithelium. Examination of several sections of the same piece of skin show that the pigment of the Malpighian layer appears first in the basal layer of cells of the epithelium lining one of the furrows of the skin, or in the basal cells of the epithelial processes between the dermal papillæ (pl. XXIII, *Epi. p.*). These first pigment granules are confined to groups of four or five cells in the above locations, the intervening cells being free from them. As we pass further into the dark area there is a gradual increase in the number of cells which contain pigment granules, and also in the amount of pigment within the



DRAWINGS, UNDER HIGH POWER, OF EPIDERMAL PAPILLÆ OF THE LIGHT NON-PIGMENTED AREA (UPPER), AND OF THE DARK AREA (LOWER)

individual cells. The cells which contain the granules are still confined to the grooves and epithelial processes, but the pigmentation gradually spreads to the sides of the epidermal papillæ and into the middle layers of cells of the stratum germinativum, where it is found in all but the two or three uppermost layers. However, this is not true of all of the epidermal papillæ of even the most highly pigmented region, as is seen from an examination of plate XXIV (upper) where most of the granules are in the basal layer. In papillæ of this type there are usually a few scattered cells above the basal layer which contain pigment granules. Three such cells are seen in the lower drawing of the same plate. In the region of greatest pigmentation the granules are not confined absolutely to the epidermal papillæ and stratum germinativum lining the furrows, but may be seen in a few of the cells covering the dermal (connective tissue) papillæ. In this location the granules are very small, and they are not numerous.

In general the pigment tends to collect in the basal layer of the epidermal processes and of the epithelium lining the grooves, but when it becomes very abundant it spreads to the upper layers and to that part of the epithelium which forms a covering to the connective tissue papillæ. All the granules are within the epithelial cells; none were seen between the cells.

The pigment granules may be found in all parts of the cell, but usually they are more abundant in the outer portion of the cell, toward the free surface of the skin (pl. XXIV, lower). If granules are present in the basal region of the cell they are usually smaller and less numerous than in the region of the outer pole.

In the light areas of the skin the irregular branched pigment cells of the corium (connective tissue portion of the skin) are very rare, but as these cells are not numerous in normal skin, the number seen here probably corresponds to the normal. In the pigmented areas their structure and location are the same as in the normal skin, but their increase in number is far beyond the normal. The epidermis of the dark areas contains a great deal more than the usual amount of pigment, but the general location and distribution of it are about the same as in the normal skin.

Careful study of the sections leads to the conclusion that there is nothing abnormal about this skin excepting the peculiar distribution of its pigment. There apparently is concentration of pigment in the dark areas with corresponding deficiency of it in the epidermis of the light areas, but its general form and distribution in the dark areas is normal. It is as though there was a repellent force in certain foci of the skin driving the pigment cells to other areas. The lack of pigment is the only feature which distinguishes the light area of the skin from the dark. The dermal papillæ and the epithelial processes between them are of the same general shape and size in both areas of the skin.

Without going further into details at this time, I may summarize the apparent positive results of this research so far in hand, as follows:

That in the family before us we see—

1. Hereditary spotting of the skin.

2. The character of spotting behaves as a simple Mendelian dominant.

3. The piebald persons are heterozygous for this character of spotting.

4. The condition of spotting is albinistic, and is progressive rather than fixed, giving progressive albinism—sometimes called dynamic leucosis.

It may be well to present here definitions of albinism in its three commonly recognized phases:

Complete albinism affords no visible pigment anywhere in *skin*, *hair*, or *eyes*.

Incomplete albinism affords visible pigment of various degrees of diffusion everywhere in *skin*, *hair*, and *eyes*.

Partial or imperfect albinism affords visible pigmentation limited to areas separated by unpigmented areas. This gives "piebald" and "spotted" cases.

Concerning the probable close interrelation between these various phases of unpigmented skin, Pearson says:

"When we consider the relative rareness of complete albinism, of the spotted or splashed condition and of xanthism, their relatively frequent coincidence in

the same stock suggests that these abnormal pigment conditions are not wholly independent, and that as a working hypothesis it is reasonable to suppose that complete albinism, partial albinism, incomplete albinism, and xanthism, all static forms of leucosis, are phases of the same process and are probably linked with leucoderma and possible other forms of dynamic leucosis. By 'linked' we suggest that they mark the complete, incomplete, local or progressive failure of the same metabolic process, which may never start at all, never start in certain areas, or be imperfectly started, and again being started may fail to maintain itself; further, that every variety of this failure may individually or collectively be associated with certain stocks, which may either show hereditary failure of one phase, of several, or exceptionally of all phases of pigment metabolism."[1]

Pigmentation is due to *pigment metabolism*. In "complete albinism" pigment metabolism completely fails to start. In "incomplete albinism" pigment metabolism occurs only incompletely. In "partial or imperfect albinism" pigment metabolism locally fails or never starts. In "progressive albinism," or dynamic leucosis, pigment metabolism, though having apparently once started at some time, fails in certain areas.

Some of the problems we are still working on in connection with this study are the following:

1. Whether the albinistic areas are more heavily haired than the pigmented areas, since complete albinos are frequently said to be more hairy than normally pigmented persons. Schwalbe says that the skin under heavily coated growths of hair is lighter in color than in less heavily coated areas. Max Weber, Rawitz, and Kuekenthal say, conversely, that the most heavily pigmented areas are denuded. If Weidenreick is right in saying that "we are accordingly justified to see in the hair a special organ for accumulating pigment of the cutaneous or epidermal pigment layer," then these albinistic areas will be found to be more heavily haired than the pigmented areas.

2. Whether the albinistic areas extend their borders after once having been known, or whether there is, instead, a progressive failure of pigment metabolism within a definite area.

[1] Anomalies of Pigmentation among Natives of Nyasaland; A Contribution to the Study of Albinism, by Dr Hugh Stannus Stannus, pp. 333–365 (quotation from pp. 361–362), *Biometrica*, Oct., 1913.

3. Whether an at-one-time albinistic area ever revives within itself the process of pigment metabolism.

4. The meaning of the median dorsal light area. Castle found a dark median dorsal area on the negro family he recorded. The dorsal area of most vertebrates is more heavily pigmented than adjoining areas; yet there is exception in the case of certain cattle with the white "line-back," and the frequent case of skunks with white patches along the dorsal line. I accept the theory so well outlined and defended by Weidenreick[1] that the function of cutaneous pigment in vertebrates is to throw off the penetrating light and to transform light rays into heat rays. Yet if this theory is true, what is the meaning of the consistently light median dorsal area in the persons illustrated herewith?

5. (In general.) The entire family, just so far as collaterals and descendants may be discovered, will be studied as completely as possible as a check on the work so far done.

The following pathologic description of the first man now known to have borne in America the patronymic of this spotted family in consideration, and who lived in New England in 1668, is worth preserving in this place. The description is found in a letter of a physician dated October 4, 1668, and copied by him on the fly-leaf of one of his medical books. I am indebted to the librarian of a New England college library for the corrected copy of this epistle, which follows. I present it with the suggestion that if more complete research proves, what members of this family believe, that this early New Englander is their family ancestor, his physical condition may have been the cause of the present hereditary skin spotting. It was because of this possible connection that I preferred to suggest in the genealogy chart that it was the male *a* instead of the female *b* who was probably abnormally pigmented.

"Deacon [George] Bartlett: I have been often sollicited to doe for ——— ——— [name given in original letter] in his sad condition, & have oft visited him & administered in time of his distemp: since his sores breaking out and

[1] Franz Weidenreick, Die Lokalisation des Pigmentes und ihre Bedeutung in Ontogenie und Phylogenie der Wirbeltiere, pp. 59–140 in Separat-Abdruck aus der *Zeitschrift für Morphologie und Anthropologie*, Stuttgart, 1912.

running I have seen them, used meanes to cleanse them & have from time to time informed them that he must have constant attendance, & be under a course of phisick if his life be saved, if meanes be not used he will live long in misery, if much meanes be used it is not for one man to beare the burden, neyther is one only called to shew mercy. I have not refused to attend him, but rather desyre some other, & I will be double my portion towards the expence. Whoever attends him, it will be double the charge to attend him in the place where he is, wherever comfortable dyet must be sutable to his weaknes & distress, & attendance added beyond w^{t} his wife can doe. a society of Indians will ioyne helpfulnes to one of there owne in distress. he must take a course of phisick to Divert the currant of humors if one running sore be healed, the humors will have vent at another place, & p^{r}ſently will be another swelling they say he is to weake to take phisick, but tis a stronger thing to dy then to take phisick, & if he becomes tenn times weaker, yet then he must take phisick or dy. these things I write to discharge myself, & let the loss of life & neglect of mercy ly at the right doore."

Subsequent research shows that the man in question died October 16, 1668, or twelve days after this descriptive letter was written.

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